AUSTRALIAN SOCIETY FOR LIMNOLOGY

Registered by Australia Post Publication No. VBG 2108

LIMNOLOGY NEWSLETTER

Volume 25. Number 1. February 1987

The Australian Society for Limnology is an association of over 400 people with professional or amateur interests related to Australian inland waters. Since its inception in 1961, the Society has played an important role in fostering limnology work in this country. The ASL promotes liaison between limnologists in academic, private and governmental institutions and has a vested interest in the conservation of aquatic and related resources. Annual conferences are held near centres of limnological interest, and the programme includes scientific sessions, field excursions and social activities.

The ASL produces a newsletter with notes on activities, articles of general interest, book reviews and conference announcements; a Bulletin of original scientific papers and occasional Special Publications. A further publication is the Directory of Australian Limnologists.

Membership applications are welcomed; five classes of subscribing membership are available:

Ordinary Members:	20.00
Student Members :	10.00
Life Members :	$200.00
Institutional Members:	Fees on Application
Sustaining Members :	Fees on Application

Membership subscriptions cover the period from 1 July to 30 June and members receive all publications. Members may also choose to receive the Australian Journal of Marine and Freshwater Research, the Australian Journal of Zoology and/or the Australian Journal of Botany at reduced rates. The subscription period for each journal is the calendar year following the year in which the subscription is paid.

ASL Executive 1986-87

President: Ian Campbell

Past-President: John Kirk

Vice-President: Terry Hillman

Treasurer/Membership Officer
: Margaret Hart

Secretary: Richard Marchant
Museum of Victoria
71 Victoria Cres.
ABBOTSFORD, 3068
AUSTRALIA.

Executive Committee:

Michele Barson
Stuart Halse
Jocelyne Hughes
Maryanne McKaige
David Mitchell
Russell Shiel
Russell Tait
David Tiller

NEWLETTER EDITOR:

Michele Barson
Dept. Resources and Energy
GPO Box 858
CANBERRA 2601.

Enquiries relating to membership should be directed to: Mrs M. Hart
Treasurer/Membership Officer ASL
22 Netherby Ave
MULGRAVE 3170
AUSTRALIA

LIMNOLOGY
NEWSLETTER
Volume 25. Number 1. February 1987

Contents

Presidential Address, Lorne, May 1986 3
Past ASL Congresses and Major Office Bearers 7
Obituary, Aubrey Gordon Nicholls 8
Tribute to Aubrey Gordon Nicholls 15
Book Review 17
New Books 18
Request for larval Macrogyrus striolatus 20
Conference Announcements 21
FASTS News 25
1986 Fun Run Results 27
Limnology Bibliography 28
Coming Events 32

PRESIDENTIAL ADDRESS BY IAN CAMPBELL

ASL MAY 1986

As a young graduate student I have vivid memories of ASL Annual General Meetings at which an eminent cold climate kiwi copepodologist expounded with great force and at great length on the evils of allowing citation of articles from the ASL Newsletter. Those elderly members who recall Dave Pollard's presidential address at the Lismore Congress may find some of the material of my address familiar. Fortunately you will be unable to prove I have plagiarised without citing an article printed (but not of course published!) in the ASL Newsletter, and to do so would of course bring down upon you the wrath of the aforementioned copepodologist. A wrath which, as George Ganf's spectacle repairman will assure you - is terrible indeed.

Dr Pollard's review of the early days of the Society was occasioned by the Society's 15th Annual Congress - David considered 15 to be the age of consent. This Congress marks a quarter of a century for the Society and it seems an appropriate time for another review of the Society's progress as well as a chance to pay homage to those who created it and reminisce about earlier times.

In the interests of providing an accurate historical review of the Society, I have restricted its content to events recorded in the minutes, newsletters and other Society documents, unless of course hearsay and rumour seemed more interesting or colourful. As a result of this restriction I will not be including any mention of the dreaded Kinchega Meeting and the embarrassing incidents involving Peter Tyler and a partly consumed sheep, Don Buckmaster's disastrous attempt to demonstrate fire eating with a mouth full of lighter fluid or the fact that Ros St Clair spent most of the conference in a bog.

It is however, recorded in the Newsletter that following the first meeting, at Monash University, the participants travelled to Snobs Creek where they were entertained by the "stripping of female trout", and that the Annual Dinner at the 7th Meeting was enlivened by the presence of 28 Year 12 Biology students from Ruyton Girls School (Kew).

The Society was formed largely at the instigation of Hilary Jolly, who had suggested the idea to John Lake and Jim Wharton. A meeting held in Canberra on 21 October 1961, led to the inaugural meeting of the Society at 10.00am on Saturday 26 May 1962, at Monash University. The meeting was attended by about 33 people and elected Dr Aubrey Nicholls founding President. The Vice President was John Lake, Bill Williams was the Secretary/Treasurer and Allan Weatherley became the Editor. Dr Francois of the NSW Fisheries recommended that future meetings be held in warmer months.

Four scientific papers were read to the meeting. Dr Nicholls presented a paper on "The Food Potential of Freshwaters", Mr Dunbavin Butcher on "The Influence of the Environment on Freshwater Fisheries Management", Mr Edgar Riek on "Insects and the Aquatic Environment" and a Mr Ian Bayly from Queensland presented a paper on some planktonic crustaceans of little importance and no general interest.

The first Society newsletter appeared in October 1962 and included a report on the conference together with some details on the main office bearers. One of the more interesting items was that Prof Williams was preparing a taxonomic re-evaluation of the Australian amphipods. This work was further reported the following year with a request for material.

The second Society newsletter in 1963, I note with interest began with an editorial on the need for conservation of Australian inland waters, whilst the third argued the case for a "Centre for Limnological Research" in Australia. A letter in this issue warned of the potential dangers of Salvinia molesta in Australia. Dr Nancy Burbridge (CSIRO Division of Plant Industry) wrote "This is a case where we have, for once, an opportunity of keeping the door shut before the horse has bolted".

At the third conference held in Canberra in 1964 there were six presentations - 3 full papers and 3 short presentations. One of these was a paper by Mr P. Lake who, the Editor (his supervisor), wrote "attempted to give a preliminary picture of the effects of zinc on the communities of animals in the Molongolo River". Attendees at the conference were fed grilled Murray Cod and entertained with demonstrations of killing fish with rotenone.

In 1964 an editorial in the newsletter marked the centenary of the introduction of trout into Australia - in the following year the Editor on a trip to the Kimberley's was bitten 3 times by a snake. And in November 1965 the editorial expressed concern at the fate of Lake Pedder and its biota.

The Society at this time was split between fisheries biologists who wouldn't know an invertebrate from a bunch of bananas, and invertebrate people whose only interest in fish was culinary. The Editor at the time became so concerned with the preponderance of invertebrate material appearing in the Monash based newsletter that he used the word "trout" twice in the editorial.

The period 1967-8 was an important one for the Society and Australian limnology. Weatherley's book "Australian Inland Waters and Their Fauna" was published as was Williams "Australian Freshwater Life". The Society published its "Key to the Genera of Crustacea in Australian Inland Waters" in 1967 and in May 1968 the decision was made to publish a scientific journal - the ASL Bulletin. The first issue appeared in October 1969 and was reissued in February 1970.

About this time, the Australian Academy of Sciences produced a proposal for a biological survey of Australia. The newsletter published correspondence between Dr Tyler and Prof Fenner of the Academy, in which Dr Tyler commented "I was struck forcibly by the lack of reference, either directly or by implication, to ecosystems other than terrestrial ones". Prof Fenner replied that "You will be glad to know that the importance of freshwater biology was not overlooked during the discussions which preceded the production of the report, but it was felt that limnology should be developed during the second part of the operation". The Academy's report led eventually to the establishment of ABRS - regrettably the neglect of freshwater systems was not rectified as a result of Peter's letter and continues with ABRS to the present.

In May 1981 the Executive Committee recommended that a donation to the Society by Hilary Jolly be used to establish an award or citation from the Society for any student, scientist, corporation, person or body worthy of recognition for an outstanding contribution towards the aims of the Society. It was later decided to name this award the Hilly Jolly Award, and the first recipient was Allan Weatherley in 1974. The second recipient was Ian Bayly in 1975 and he was invited to present the inaugural Jolly Award address which he did at the 1976 meeting on the topic of "Hilary Jolly - an appraisal of the woman and her contribution to Australasian limnology". This followed the death of Hilary in October 1975. The paper was subsequently printed in the newsletter. Since then there have been a further 10 Jolly Award winners.

In 1981 the Student Award for the best student paper was instituted, the first award winner being Rod Oliver. From 1984, student travel awards have been made available for students to attend the conference.

It is an appropriate time - after 25 years to evaluate the Society's achievements - and areas where we have yet to achieve.

We can be proud I think - of the growth in limnology that has occurred partly, perhaps largely, as a result of the Society's activity. conferences have grown from 33 attendees to over 150 and the number of papers from 4 to about 50. This growth is more remarkable when one considers that ASPAB and fish biology societies have been formed during this time. So that freshwater science has grown through the proliferation of societies as well as the increasing size of societies.

The increase in number of papers presented has been accompanied by an increase in quality of papers. The quality of research has also improved, partly because of the improved information base on which we stand, partly because of growth in the limnological community and the challenges that has brought.

Publications of the Society have played an important role in the growth of limnology in Australia - the special publications, the Bulletin, the "Book", and of course the Newsletter, which has printed a number of articles of

inestimable scientific value including those on "Bottomless Lakes" and "Bottomless Lakes in more Depth" by Brian Timms (I. Bayly, please note this is a mention - not a citation). The ASL conferences have grown five-fold, but I believe still retain their informal character. Ten years ago David Pollard commented that the congresses were for him the heart of the Society - I believe that is still the case.

But what are the things we have not yet achieved? One is Bill Williams taxonomic revision of the Australian amphipods - but there are other things too. We have not yet - as limnologists with common interests - acquired sufficient political voice to have those interests heard.

In 1972 at Narrandera I participated in an extended debate as to whether the Society should make a statement to the Tasmanian Government asserting the scientific value of Lake Pedder. A motion to that effect was passed by a single vote. Since then we have accepted, I believe, that the Society properly has a role in espousing the protection of limnological sites which we perceive to be of scientific importance. But our ability to protect such sites depends on our ability to act as a group and to exert pressure as a group for an extended period.

The story of issues of importance to limnologists in the past 25 years has been to a large extent a story of individuals fighting the battles, while the Society looked on with sympathy but little support. The story is the same for the Freshwater Institute, for ABRS, for Lake Pedder and the Heritage Commission sites.

If limnologists are to have the influence on Australian society that is necessary in the most arid continent - the ASL must become an effective political vehicle for putting our views. The challenge now is to find the way to remould the Society - preserving its strengths - the informality, comradeship and humour - while adding political muscle.

PAST ASL CONGRESSES AND MAJOR OFFICE BEARERS

Bill Williams has supplied a more complete version of this list which was circulated at ASL's Twenty fifth Congress at Lorne, Vic.

	Year	Congress Venue	President	Vice-Pres	Sec/Tres	Editor
1.	1962	Melbourne (Vic)	Nicholls	Lake	Williams	Weatherley
2.	1963	Narrandera (NSW)	Lake	Weatherley	Williams	Weatherley
3.	1964	Canberra (ACT)	Lake	Jolly	Francois	Weatherley
4.	1965	Brisbane (Qld)	Weatherley	Bayly	Francois	Bayly
5.	1966	Miena (Tas)	Strahan	Lynch	Francois	Bayly
6.	1967	Warragamba (NSW)	Wharton	Lynch	McKenzie	Bayly
7.	1968	Renmark (SA)	Jolly	Francois	Lake	Williams
8.	1969	Jindabyne (NSW)	Lynch	Hiscock	Wharton	Williams
9.	1970	Colac (Vic)	Hiscock	Bayly	Wharton	Smith
10.	1971	Hobart (Tas)	Francois	Morrissy	Pollard	Smith
11.	1972	Narrandera (NSW)	Williams	McMichael	Wharton	Geddes
12.	1973	Jamieson (Vic)	McMichael	Midgley	Buckmaster	Geddes
13.	1974	Tewantin (Qld)	Powling	Tyler	Buckmaster	Walker
14.	1975	Canberra (ACT)	Walker	Buckmaster	Buckney	Walker
15.	1976	Tanunda (SA)	Pollard	Cannon	Buckney	Williams
16.	1977*	Lismore (NSW)	Buckmaster	Llewellyn	Hart	Williams
17.	1978*	Menindee (NSW)	Bayly	B. Hart	Campbell	Lake
18.	1979*	Tallangatta (Vic)	Tyler	Lake	Campbell	Lake
19.	1980*	Queenstown (Tas)	Lake	Burns	Campbell	White
20.	1981*	Narooma (NSW)	Burns	Mitchell	M. Hart	White
21.	1982*	Griffith (NSW)	Mitchell	B. Hart	M. Hart	White
22.	1983*	Brisbane (Qld)	B. Hart	Kirk	M. Hart	Campbell
23.	1984*	Mt Gambier (SA)	Kirk	Campbell	M. Hart	Campbell
24.	1985Ø	Jarrahdale (WA)	Campbell	Hillman	M. Hart	Barson/ Campbell**
25.	1986*	Lorne (Vic)	Campbell	Hillman	R. Marchant /M. Hart	Barson/ Campbell**

* May
Ø August
** Bulletin Editor

OBITUARY

AUBREY GORDON NICHOLLS
21 November 1904-14 July 1986

Dr Aubrey G. Nicholls, a most distinguished and versatile zoologist and aquatic ecologist, died in Adelaide on 14 July 1986 at the age of 81.

It is not surprising that Aubrey became a zoologist; his father, George E. Nicholls, was Professor of Zoology at the University of Western Australia from 1921-1948, and was a carcinologist noted particularly for his work on the distinctively Australian group, the Phreatoicidea (Isopoda).

Aubrey received his B.Sc. in 1927, and B.Sc. with First Class Honours in 1929 from the University of Western Australia. His first work was on termites, but in 1928 he joined the Great Barrier Reef Expedition led by C.M. Yonge and lived for a year on Low Isles. During this time he was associated with Yonge in pioneering work on the physiology of corals which was published in the Great Barrier Reef Expedition Scientific Reports (see appended list of publications).

In 1929 he travelled to England where he enrolled as a Ph.D. student at University College, London, but worked at Plymouth Marine Laboratory on the biology of the marine isopod, Ligia oceanica, for the degree which he received in 1932.

In 1932 he joined the staff of the Marine Station at Millport in the Firth of Clyde. There he joined forces with Sheina M. Marshall and A.P. Orr and commenced work on the ecology of the marine calanoid copepod Calanus. In 1933 he authored the first of a now famous series of 13 papers "On the biology of Calanus finmarchicus" published in Journal of the Marine Biological Association of the UK. Later in the series he was joined by both Marshall and Orr as co-authors. Much of this early work by Aubrey has stood the test of time. Only one week before commencing this obituary I picked up the recent book "Marine Plankton Life Cycle Strategies" (Eds K.A. Steidinger & L.M. Walker) and there on page 84 of Charles Davis' chapter was that striking and unmistakeable figure, the caption of which read "The 'classical' picture of diel vertical migration from observations on Calanus finmarchicus (from Nicholls A.G. ... 1933. With permission.)". The importance of this animal, and of Nicholls' work (with Marshall and Orr) on it, cannot be overstressed.

Species of marine copepods of this genus are probably the most abundant animals in the world. According to Russell-Hunter, they are almost certainly more numerous than the most numerous of insects on land, and they may even outnumber the much smaller free-living soil nematodes and soil protozoans. Numbers aside, species of Calanus constitute the world's largest stock of living animal protein. This fact makes the

applied potential of the studies carried out by Nicholls and his co-workers difficult to over emphasise. Marshall and Orr's book "The Biology of a Marine Copepod, Calanus finmarchicus (Gunnerus)", published in 1955, incorporated a significant amount of Nicholls' work. (Sheina Marshall was elected F.R.S. in 1963 mainly for her work on Calanus. When I met and stayed with her at Millport in December 1967, I noted that she was very generous in her praise of Aubrey and his work. She died in 1977.) Aubrey's work on Calanus was one of his most notable contributions to biology.

During his stay at Millport, Aubrey also became involved in an investigation of herring ecology. In his biographical memoir of Sheina Marshall, Sir Frederick Russell (1978) described this as follows:

> "In 1934 and 1935 in order to carry their study of marine production to the fish level, Sheina and A.P., together with Aubrey Nicholls, investigated the production of herring. After a preliminary research the spawning ground off the south-west coast of Arran was selected. 'The intention was to take weekly samples of the larvae and to follow the changes in length, weight, chemical composition, and food and to correlate the last with changes in the plankton.'
>
> "This was probably the most complete observation made on a single stock of herring. Having located the spawning ground, the larvae were followed on their northerly migration until metamorphosis in Loch Fyne. Rate of growth in length of about 3mm per week was found. In this investigation most of the work had to be carried out at night when the larvae are most abundant in collections and in this Sheina took her full share. Aubrey Nicholls recalls 'the many dreary hours we spent in a fruitless search for herring larvae, returning night after night to continue the search until success was achieved.'."

Another major research theme initiated by Nicholls during his seven-year stay at Millport was the taxonomy of psammophilous harpacticoid copepods. This work, which was later continued in Australia, is well cited in texts on the fauna and ecology of marine sandy beaches. He is justifiably regarded as a noted pioneer worker on marine interstitial fauna.

In 1939 Nicholls returned to Australia and became a Senior Research Fellow attached to the Zoology Department of the University of Western Australia. Here he consolidated his world reputation as a copepod taxonomist, paying particular attention to the Harpacticoida. Publication of much of his work at this time was held up by the war years, with a consequent flurry of papers from 1944-1946.

In 1947 Aubrey Nicholls commenced what was to become a 22 year association with the CSIRO Division of Fisheries and Oceanography. (When he joined, it was the Division of Fisheries.) From 1947-1949 he was stationed at Cronulla, but in May 1949 he moved to establish a laboratory at "Stowell",

Hobart, for the purpose of evaluating the state of trout populations in Tasmania. A mature trout is several orders of magnitude larger than an harpacticoid copepod (and infinitely easier to dissect), but Aubrey's versatility as a biologist came to the fore, and he was more than equal to the rather drastic change in taxon. His work on Tasmanian trout was remarkably successful, but, rather than appraise it myself, I prefer to quote others. In 1962 Alan Weatherley, who worked with Aubrey in Tasmania, wrote as follows:

> This (trout) study, marked as always with the painstaking thoroughness, persistence and originality of approach typical of his work, has won for Nicholls a new audience overseas and in this country. It is fair to say that he has performed on trout one of the most exhaustive studies of its kind ever to appear in print anywhere, and Australian inland fishery workers in particular all owe him an incalculable debt."

In their tribute to Aubrey published in "The Mercury" on 22 July and in "The Weekend Australian" on 27 July 1986, the Tasmanian Inland Fisheries Commission said:

> "Dr Nicholls' ten year investigation of lakes and streams laid the foundation for trout management in Tasmania and many of his findings and recommendations remain valid to the present day."
>
> "Aubrey Nicholls made a great and lasting contribution to the Tasmanian trout fishery and anglers, fisheries managers and researchers alike long remember his enthusiasm, dedication, scientific skill and foresight. Dr Nicholls set an example that modern researchers strive to emulate."

An appraisal of Nicholls' work on trout in Tasmania written by my colleague Dr P.S. Lake follows this article.

It was during Aubrey's 12 year stay in Tasmania that I first established professional contact with him after my arrival in Australia from New Zealand. My files show that I first wrote to him in 1959, and in 1960 he sent me numerous plankton samples from a variety of Tasmanian lakes. He also sent me plankton collections from the Derwent estuary which had been taken at night by submarine light from the Hobart Bridge in March 1956.

In 1961 the Hobart laboratory was closed down, and in 1962 Aubrey and his small group of associates opened a new laboratory (the Southern Pelagic Project) at Camberwell in Melbourne. In 1962 Aubrey was also accorded significant recognition by his colleagues; he was elected as the first President of the Australian Society for Limnology.

At the Camberwell laboratory Nicholls continued work on the Australian "salmon" until the laboratory was closed down at the end of 1969 and he officially retired. However, he continued to work on the "salmon" data until it was published in 1973.

Aubrey Nicholls was always very kind and encouraging to me and other workers. He was especially helpful when I was setting out to become a copepodologist myself. I was deeply touched when, with the closure of the Camberwell laboratory, he donated to me an extensive reprint collection and many rare books dealing with copepods. These are presently housed in my office, but I should like it to be known that any zoologist is welcome to have access to them by arrangement with me. Additionally, a further extensive (about six metres of shelf space) collection of Nicholls' reprints (non-copepod, marine and freshwater topics) is housed in our Departmental library, and, again, access is available by arrangement with our Chairman's secretary.

Our Department is also indebted to Aubrey for donating a large stainless steel sink for our field station located at Alvie near Colac in the western district of Victoria. This has served many limnology graduate students very well.

Aubrey Nicholls was one of Australia's most distinguished hydro-biologists, yet during his life his achievements, particularly in marine biology, went largely unsung. May his posthumous recognition be greater.

Vale, Aubrey Nicholls

Ian A E Bayly
Zoology Department
Monash University
14.01.87

THE PUBLISHED WORKS OF THE LATE AUBREY G. NICHOLLS

1. 1929 A new species of termite from the eastern goldfields region of Western Australia. J.R. Soc. West.Aust. 15, 19-23.

2. 1931 On the breeding and growth rate of the Black-lip Pearl Oyster (Pinctada margaritifera). Repts Gt Bar. Reef Comm. 3:26-31.

3. 1931 Studies on Ligia oceanica. I. (A) Habitat and effect of change of environment on respiration. (B) Observations on moulting and breeding. J. Mar. Biol. Assoc. UK 17:655-674.

4. 1931 Studies on Ligia oceanic. II. The processes of feeding, digestion, and absorption with a description of the structure of the foregut. J. Mar. Biol. Assoc. UK 17:675-708.

5. 1933 On the biology of Calanus finmarchicus. I. Reproduction and seasonal distribution in the Clyde Sea-area during 1932. J. Mar. Biol. Assoc. UK 19:83-110.

6. 1933 On the biology of Calanus finmarchicus. III. Vertical distribution and diurnal migration in the Clyde Sea-area. J. Mar. Biol. Assoc. UK 19:139-164.

7. 1933 Some aspects of the biology of Calanus finmarchicus. Glasgow Nat. 11:46-49.

8. 1934 The developmental stages of Euchaeta norvegica Boeck. Proc. R. Soc. Edin. 54:31-50.

9. 1935 The larval stages of Longipedia coronata Claus, L. scotti G.O. Sars, and L. minor T. and A. Scott, with a description of the male of L. scotti. J. Mar. Biol. Assoc. UK 20:29-46.

10. 1935 Copepods from the interstitial fauna of a sandy beach. J. Mar. Biol. Assoc. UK 20:379-405.

11. 1939 Some new sand-dwelling Copepods. J. Mar. Biol. Assoc. UK 23:327-341.

12. 1939 Marine Harpacticoids and Cyclopoids from the shores of the St Lawrence. Nat. Can. Quebec 66:241-316.

13. 1941 Littoral Copepoda from South Australia. I. Harpacticoida. Rec. S. Aust. Mus. 6:381-427.

14. 1941 The developmental stages of Metis jousseaumei (Richard) (Copepoda, Harpacticcoida). Ann. Mag. Nat. Hist. (11) 7:317-328.

15. 1941 A revision of the families Diosaccidae Sars 1906, and Laophontidae T. Scott 1905 (Copepoda, Harpacticoida). Rec. S. Aust. Mus. 7:65-110.

16. 1942 A review of the genus Zaus Goodsir, and a description of two species of Laophonte Philippi (Copepoda, Harpacticoida). Ann. Mag. Nat. Hist. (11) 9:119-127.

17. 1943 Marine Copepoda from Western Australia. I. Littoral Harpacticoids from Rottnest Island. J.R. Soc. West. Aust. 27: 135-141.

18. 1944 Littoral Copepoda from South Australia. II. Calanoida, Cyclopoida, Notodelphyoida, Monstrilloida, and Caligoida. Rec. S. Aust. Mus. 8:1-62.

19. 1944 Littoral Copepoda from the Red Sea. Ann. Mag. Nat. Hist. (11) 11:487-503.

20. 1945 Marine Copepoda from Western Australia. III. Littoral Harpacticoids from Port Denison. J.R. Soc. West. 29:1-16.

21. 1945 Marine Copepoda from Western Australia. IV. Psammophilous Harpacticoids. J.R. Soc. West. Aust. 29:17-24.

22. 1945 Marine Copepoda from Western Australia. V. A new species of Paramesochra, with an account of a new Harpacticoid family, the Remaneidae, and its affinities. J.R. Soc. West. Aust. 29:91-105.

23. 1945 A new Calanoid Copepod from Australia. Ann. Mag. Nat. Hist. (11) 12:501-514.

24. 1946 Syncarida in relation to the interstitial habitat. Nature, Lond. 158:934-936.

25. 1948 Marine biology in Western Australia. J.R. Soc. West. Aust. 33:151-162

26. 1957 The Tasmanian trout fishery. I. Sources of information and treatment of data. Aust. J. Mar. Freshw. Res. 8:451-475.

27. 1958 The Tasmanian trout fishery. II. The rivers of the north-west region. Aust. J. Mar. Freshw. Res. 9:19-59.

28. 1958 The Tasmanian trout fishery. III. The rivers of the north and east. Aust. J.Mar. Freshw. Res. 9:167-190.

29. 1958 The population of a trout stream and the survival of released fish. Aust. J. Mar. Freshw. Res. 9:319-350.

30. 1958 The egg yield from brown and rainbow trout in Tasmania. Aust. J. Mar. Freshw. Res. 9:526-536.

31. 1961 The Tasmanian trout fishery. IV. The rivers of the south and south-east. Aust. J. Mar. Freshw. Res. 12:17-53.

32. 1961 Stocking with trout. Aust. Fish. Newsl. 21.

33. 1963 Freshwater life as fish food. Victoria's Resources 5(1):9.

34. 1973 Growth in the Australian "Salmon" Arripis trutta (Block & Schneider). Aust. J. Mar. Freshw. Res. 24:159-176.

- in collaboration with S.M. Marshall and A.P. Orr

35. 1934 On the biology of Calanus finmarchicus. V. Seasonal distribution, size, weight, and chemical composition in Lock Striven in 1933, and their relation to the phytoplankton. J. Mar. Biol. Assoc. UK 19:793-828.

36. 1935 On the biology of Calanus finmarchicus. VI. Oxygen consumption in relation to environmental conditions. J. Mar. Biol. Assoc. UK 20:1-28.

37. 1937 On the growth and feeding of the larval and post-larval stages of the Clyde Herring. J. Mar. Biol. Assoc. UK 22:245-267.

38. 1939 On the growth and feeding of young herring in the Clyde. J. Mar. Biol. Assoc. UK 23:427-455.

- in collaboration with C.M. Yonge

39. 1931 Studies on the physiology of corals. IV. The structure, distribution and physiology of the Zooxanthellae. Gt Barrier Reef Expdn, Sci. Repts 1:135-176.

40. 1931 Studies on the physiology of corals. V. The effect of starvation in light and darkness on the relationship between corals and Zooxanthellae. Gt Barrier Reef Expdn, Sci. Repts 1:177-211.

41. 1932 Studies on the physiology of corals. VI. The relationship between respiration in corals and the production of oxygen by their Zooxanthellae. Gt Barrier Reef Expdn, Sci. Repts 1:213-251.

- in collaboration with A.H. Weatherley

42. 1955 The effects of artificial enrichment of a lake. Aust. J. Mar. Freshw. Res. 6:443-468.

TRIBUTE TO AUBREY G. NICHOLLS

Recently in Adelaide a pioneer in Australia freshwater fish ecology, Dr Aubrey G. Nicholls, died at the age of 81 years. His death was noted in an unusual obituary in "The Weekend Australian" (27 July 1986) from the Inland Fisheries Commission of Tasmania. The notice drew attention to the lasting value of Aubrey Nicholl's research work for the Tasmanian trout fishery.

In 1945 Tasmanian trout anglers increasingly dissatisfied with the state of the trout fishery pressured the "Salmon and Freshwater Fisheries Commissioners" to request the CSIRO to investigate the cause of the decline. In 1947 Dr Nicholls, then with the CSIRO Division of Fisheries, was appointed to carry out the investigation and in 1949 he transferred to Hobart.

Dr Nicholls and his small team then embarked upon an exhaustive investigation of the fishery, using laboratory studies, creel censuses, population surveys, tagging returns and field manipulation experiments to investigate the state of trout populations in both rivers and lakes of northern, central and southern Tasmania.

The results of the investigations of trout populations in rivers were published in a series of papers (1957-1961), which painstakingly documented the unpopular findings (from the point of view of the anglers). Dr Nicholls found that in the rivers there was no evidence of overfishing and that one of the reasons for the perceived decline in the fishery was not a decline in the density of trout but "an increase in the number of inexperienced anglers".

A commonly held belief of trout anglers was and still is that, to maintain a trout fishery, stocking of the streams by hatchery operations is essential. However, after comprehensive studies in northern Tasmanian streams, including a study which involved releasing 10 000 yearling fish into the North Esk River, Nicholls concluded hatchery operations were not required to maintain the fish populations. From the North Esk River study Nicholls concluded that of "every 100 fish taken by anglers, two may have resulted from stocking". Thus, a very unpopular finding of Nicholls was that "stocking rivers and lakes with hatchery-reared fish is unnecessary and therefore wasteful in those waters of Tasmania where conditions are suitable for natural spawning to occur successfully". In retrospect this finding appears to be common sense, but at the time Nicholls was working, such a finding was heresy for many anglers. Dr Nicholls' work provided a sound basis for trout management in Tasmania and south east Australia and, as stated by the Commission, "many of his findings and recommendations remain valid to the present day".

Nicholls' work on the trout river fisheries was published but this work on lake fisheries was unpublished. Fortunately, his scrupulously neat and well documented data are available to Drs Peter Davies and Robert Sloan, Inland Fisheries Commission

biologists, and have been invaluable for their work on the management of trout in Great Lake. In 1945 Nicholls initiated a study of the age structure of spawning fish which run from Great Lake to Liawenee Canal. This data collections process has continued to the present, and in the words of Dr Peter Davies, (Inland Fisheries Commission) it "turns out to be the only piece of consistently collected south-east Australian long-term fisheries data set".

Dr Nicholls was not only a pioneer in freshwater fish ecology and management in Australia, but had a high international reputation for his excellent work on marine zooplankton. He was founding member of the Australian Society for Limnology and was its first President.

His work on the ecology of trout in Tasmania will be of great use in a scientific and managerial sense for many generations to come.

P.S. Lake
22.08.86

BOOK REVIEW

"WATER MITES FROM AUSTRALIA"
BY D.R. COOK

Reviewed by Mark S. Harvey, Biological Survey Department, Museum of Victoria, 71 Victoria Crescent, Abbotsford, Vic, 3067

Although water mites are relatively common in freshwater systems, the Australian species have until recently been little studied. Approximately 100 species have been recorded up to 1985, the descriptions being scattered in many papers and usually published in German. The lack of species descriptions has hampered detailed ecological analyses. The recent publication of "Water Mites from Australia" by D.R. Cook (Memoirs of American Entomological Institute, vol 40, pp 1-568, 1986) has redressed the balance. In this work, Cook redescribes most of the previously described species, and describes 203 new species in 64 genera and 19 families from material collected on a three month field trip to eastern Australia in 1981. The numerous figures are of excellent quality which, although situated after the text and not interspersed throughout it, greatly improve the usefulness of the paper. Perhaps the most frustrating aspect are those species in which only one sex was collected, thus rendering the identification of the opposite sex a moderately hazardous procedure, especially if the described sex is not present in your own sample. A few typographical errors have escaped the arduous task of proof-reading such a large document, but they rarely detract from the overall quality of the publication.

While it is apparent that there are genera yet to be recorded from this continent and that many further species await description, this publication will undoubtably become a standard reference text for all limnologists in this country who are interested in the identification of invertebrates.

NEW BOOKS

FLORA OF NEW ZEALAND DESMIDS
VOLUME 1
HANNAH CROASDALE AND ELIZABETH FLINT

The Publishing Division of the New Zealand Government Printing Office has announced the publication of Flora of New Zealand Desmids Volume 1, a further volume in the Flora of New Zealand series. It is the first of three volumes which will deal with desmids.

The text contains illustrated descriptions and keys to identification of taxa found in New Zealand belonging to the families Mesotaeniaccae, Gonatozygaccae, Peniaccae, Closteriaceae, and up to Micrasterias in suborder Desmidiineae, in all, 218 taxa in 14 genera. Geographical distribution and ecological comments are provided.

A feature of this flora is the large number of plates.

The introductory material includes an annotated list of habitats where the Desmids came from and ecological data about some of these. There is also a glossary of relevant terms, a comprehensive bibliography and an index.

Copies can be obtained from: Mail Orders, Publishing Watehouse, PO Box 14-277, Kilbirnie, WELLINGTON, NEW ZEALAND.

Cost: NZ$49.95 plus $3.75 postage.

PHYTOPLANKTON ECOLOGY

Structure, Function and Fluctuation

Graham P. Harris
Divisions of Fisheries Research and Oceanography
CSIRO Marine Laboratories
Hobart, Tasmania

Contents: Preamble; Ecological theory; Some basic physics; The chemical environment; Defining the scales of interest; The measurement of productivity and growth rates; The concept of limiting nutrients; Physiological scales: non-steady state conditions in the field; Seasonal patterns of distribution and abundance; Community structure and function in turbulent environments; Large number systems: empiricism; Interannual variability; References; Index.

Graham Harris describes the relationships between phytoplankton and the natural, fluctuating environment. The relationship is reviewed at successively larger scales, from physiological mechanisms to interannual variability. The information derived from these investigations is integrated to provide a general understanding of population and community processes.

Basic ecological concepts such as limiting resources and competition are critically reviewed and the author concludes that the generally accepted concepts of equilibrium theory are only applicable as a limiting case when no environmental fluctuations exist.

May 1986 394 pages
Hardback £30.00

Order From: Madeleine Parkyn, Promotion Department, Chapman and Hall, 11 New Fetter Lane, London EC4P 4EE. Postage and packing: £1.00 surface; £5.00 airmail.

STREAM PROTECTION

The Management of Rivers for Instream Uses

Edited by Ian C. Campbell

Content: Introduction; Stream Communities and the Management of Streams (P.S. Lake); Hydrology and Management of Australian Streams (T.A. McMahon); Riparian Influence on Stream Ecosystems (K.W. Cummins); Forestry Practices and Stream Communities with Particular Reference to New Zealand (M.J. Winterbourn); The Use of Buffer Strips in Controlling Agricultural Runoff(C. Fitzpatrick): Response of Stream Fish Populations to Changing Land Use (M.A. Wilzbach); Approaches to Determining Flow and Habitat Requirements for Freshwater Native Fish in Victoria (J. Koehn); Flow Regulation in the Murray River System and its Effect on the Native Fish Fauna (P.L. Cadwallader); Fish Passage in Australia (J.H. Harris); Evaluation of Instream Flow Methodologies for Freshwater Fish in New South Wales (B.A. Richardson); River Protection and Flow Requirements for Fish: The New Zealand Experience (L. Tierney); Criteria for Evaluating Streams for Protection (L.A. Macmillan); Protecting Streams: a Complex Problem (I.C. Campbell).

Published by: Water Studies Centre, Chisholm Institute of Technology, East Caulfield, Australia, 3145.

Price: $Aust 20 including packaging and postage. Overseas price $Aust. 25.

REQUEST FOR LARVAL MACROGYRUS STRIOLATUS

Frances Michaelis has forwarded a request for larval specimens of the above species for Sr F. Crespo, an Argentinian entomologist, working on the systematics of aquatic beetle larvae (mainly family Gyrinidae). If you can lend a larval specimen or provide the name of someone who can, please contact:

Sr Francisco Crespo
Departamento de Biologia
Facultad de Cs Exactas y Naturales
universitlad de Buenos Aires
Ciudad Universitaria Nunez
Pabellon 2
1428 CAPITAL FEDERAL
ARGENTINA

CONFERENCE ANNOUNCEMENTS

ANZAAS TOWNSVILLE 1987

The ANZAAS Congress is being held in Townsville in the week August 24-28, 1987. The general theme is "Science and Life in the Tropics". There will be a symposium on tropical fresh waters with two sessions:

(i) biological processes in tropical fresh waters

(ii) pollution and management problems in tropical fresh waters.

Anyone wishing to offer a paper should contact Richard Pearson, Department of Zoology, James Cook University, Townsville, Qld 4811, Tel (077-844540) as soon as possible as the broad program needs to be finalised shortly.

Please make note of the wonderful limnological opportunities awaiting you in north Queensland in August! Rainforest streams, the Burdekin River, large dams, crater lakes, marlin fishing, the GBR and the Sheraton Breakwater Casino (which all qualify if taken with a pinch of salt or a dash of soda).

Other symposia in the Biological Science section are:

. The Crown of Thorns Starfish
. Tropical Rainforests
. Dangerous animals of tropical Australia
. Exotic animals in tropical Australia
. Plant-herbivore relationships in the tropics
. Farming the sea: prospects for aquaculture.

Other sections also include sessions of biological interest, such as those on mangroves, tropical resource management, tropical agriculture, and diving medicine; and sessions of more general appeal include the one on "Crime in the tropics"!

Further general information is available from the ANZAAS Congress Secretariat, James Cook University, Townsville, Qld 4811.

PACIFIC SCIENCE ASSOCIATION
XVI CONGRESS, SEOUL KOREA
20-30 AUGUST 1987

Section I: Freshwater Sciences

Contributions are invited to the following sessions and should be sent to the Convenor.

Chairman: Dr J.I. Furtado, England

Convenor: Prof Min Jai Lee
President
The Korean Central Council for
Nature Preservation
Seoul, Korea

Co-convenor: Prof Young Nam Hong
Department of Botany
College of Natural Sciences
Seoul National University
Seoul, Korea

Section Plenary Speaker: Prof M. Soerjani
University of Indonesia
Centre for Studies of the Environment
and Human Resources
Jalan Salemba 4 Jakarta, Indonesia

Topic: "Effects of Population Growth on Freshwater Resources, their Use and Management in the Pacific Basin"

1. Systematics and Ecology of Freshwater Macrophytes
   Organiser: Prof In Kyu Lee
   Department of Botany
   College of Natural Sciences
   Seoul National University
   Seoul, Korea

2. Systematics, Production and Ecology of Freshwater Algae
   Organiser: Prof Yoon Kyung Chang
   Department of Biology
   College of Sciences
   Sook Myung Women's University
   Seoul, Korea

3. Mieroalgal Resources of Chemical and Natural Products
   Organiser: Prof Yung Nok Lee
   Department of Biology
   College of Sciences
   Korea University
   Seoul, Korea

4. Changes in Zooplankton Community Structure
   Organiser: Prof Kwang Il Yoo
   Department of Biology
   College of Natural Sciences
   Hanyang University
   Seoul, Korea

5. Freshwater Fish, Fish Pathogens and Fisheries
   Organiser: Prof John L. Fryer
   Department of Microbiology
   Oregon State University
   Corvallis, Oregon
   USA

6. Acidification and Other Chemical Changes in Reservoirs, Lakes and Rivers
   Organiser: Prof Chung Il Choi
   Department of Oceanography
   Collge of Natural Sciences
   Chonnam National University
   Kwangju, Korea

7. Decomposition and Nutrient Recirculation in the Freshwater Environment
   Organiser: Prof Yung Chil Hah
   Department of Microbiology
   College of Natural Sciences
   Seoul National University
   Seoul, Korea

8. Ecology of Rivers and Swamps
   Organiser: Prof Yung Ho Chung
   Department of Botany
   College of Natural Sciences
   Seoul National University
   Seoul, Korea

1988 ANZAAS CONGRESS
May 16-20, 1988

The Centenary Congress of ANZAAS will be held at the University of Sydney from 16 to 20 May 1988 and it is expected to be one of the major scientific events of the Australian Bicentenary. The first Congress of the Australasian Association for the Advancement of Science was held at the University in 1888 at the time of the Centenary.

The Organising Committee of the 1988 Congress feels that it will be a splendid occasion upon which to celebrate the successes and strengths of Australian science and technology, to emphasise significant areas of achievement, to reflect current concerns about the health of the scientific estate, and to discuss the future of science and technology especially in its relation to national welfare.

The Program Committee of the Congress is keen to establish a program of high standard which will reflect most or all of the issues implicit in the above, and is seeking suggestions for symposia topics from a wide range of specialist societies, professional institutes and other organisations.

Topics which the ANZAAS format can handle effectively, especially interdisciplinary symposia and social and economic aspects of advances in science and technology are particularly sought. Suggestions should include comments on whether the topic should be regarded as specialist, interdisciplinary, of general interest to the whole scientific community, or of interest to the community at large. Special efforts will be made to mount some symposia which will appeal to the general public. It would also help if you could provide a brief resume of what you think the symposia should cover, together with suggestions for effective speakers.

The 1988 Congress has six Sections: A. Mathematical and Physical, B. Engineering and Applied, C. Biological and Medical, D. Earth and Environment, E. Social, and F. Education and Communication. Representatives from these Sections comprise the Program Committee which will determine the final program.

ANZAAS has also offered to provide a venue during the Congress for organisations which may wish to hold symposia using their own resources.

Suggestions should be forwarded to:

James Davenport
Convenor, Program Committee
1988 ANZAAS Congress
University of Sydney
NSW 2006

AUSTRALIAN MARINE SCIENCE ASSOCIATION (AMSA) 1987 CONFERENCE AND AGM Concurrent with 1987 AUSTRALIAN PHYSICAL OCEANOGRAPHY CONFERENCE (APOC) AND AGM, James Cook University, Townsville, 12-16 May 1987

The Australasian Society for Phycology and Aquatic Botany (ASPAB) will hold their 1987 conference at James Cook University immediately prior to the AMSA and APOC conferences to allow the attendees easy access to the AMSA/APOC conferences. Registration entitles access to both the AMSA and the APOC conferences, to stimulate cross disciplinary exchanges; joint social programs have also been designed with this in mind. The unusual confluence of the AMSA and APOC conferences will be further capitalised on by sponsoring special sessions within APOC to provide a much needed forum for chemical oceanographers.

APOC will have scientific sessions independent of the broader AMSA program and will be sponsored jointly by the Australian Physical Oceanography Division of AMSA and the Australian Branch of the Royal Meteorological Society.

Three and a half days have been set aside for scientific presentations (Wednesday to Saturday morning). Workshops will be held before and after the main scientific sessions and heavy emphasis will be given to poster presentations.

Further information is available from the contact listed in "Coming Events".

FEDERATION OF AUSTRALIAN SCIENTIFIC AND TECHNOLOGICAL SOCIETIES

Extract from Newsletter No 2, November 1986

BUDGET ANALYSIS FORUM

A public forum on the Federal Science and Technology Budget held in Canberra on 6, 7 November was attended by 240 people. The forum was convened by The Academy of Science, The Academy of Technological Sciences, FASTS, The Institution of Engineers (Australia).

Delegates to the forum came from industry, State and Federal governments, as well as from the science, technology and engineering community.

The four convening later organisations considered the recommendations that emerged from the analysis at the forum. Their views were to be put by representatives to the senior officers of:

- The Commonwealth Schools Commission
- TheComonwealth Tertiary Education Commission
- The Department of Science
- The Department of Industry Technology and Commerce
- ASTEC.

The large attendance at the forum ensured its financial success - and money in the coffers for the 1987 Budget Analysis and forum which will be co-ordinated this time by FASTS with assistance from the Academy of Science.

A full Report of the Budget Analysis including the forum input will be released in February 1987.

FASTS ANNUAL GENERAL MEETING

FASTS annual general meeting was held on 10 November in Canberra. Reports were received from the President, Secretary, Treasurer and Auditor, and these are available from FASTS or your FASTS Board Member.

In an informal session, the Board outlined directions FASTS might follow in 1987. These included:

- monitoring of developments in guidelines for Animal Experimentation
- liaison with parents' and teachers' organisations with a view to increasing student participation and achievement in science and technology - and particularly for those groups presently underrepresented such as women and girls
- obtaining information on the effect on research of the Government's introduction of fees for overseas post-graduate students
- obtaining information on the continuing "brain drain" of Australian talent
- improving the lobbying process to reflect further FASTS concerns in the areas of Arts Heritage and Environment, and Construction.

FASTS NOVEMBER 1987 COUNCIL MEETING

The Annual General Meeting of FASTS in 1987 will be a Council Meeting with representatives from each society. New Board Members, Executive Members and Officers will be elected.

1986 FUN RUN RESULTS

1.	Bruce Chessman	10.30	
2.	David Robinson	10.37	
3.	Peter Breen	10.55	
4.	Stuart Halse	10.55	
5.	Ian Rutherford	11.04	
6.	Wendy Stevenson	11.05	
7.	Simon Blake	11.22	
8.	Bodhan Harasymiw	11.36	
9.	Andrew Morison	11.49	
10.	Janet Dunbabin	11.59	
11.	Bob Bannan	12.05	
12.	David Catwright	12.39	
13.	Richard Norris	12.43	
14.	Michael O'Connor	13.05	
15.	Patrick McBride	13.20	
16.	Steven Begg	13.37	
17.	Roy Swain	13.47	
18.	Peter Davies (WA)	13.52	
19.	Ian Campbell	13.52	
20.	Stuart Bunn	13.58	
21.	Jenny Davis	14.17	
22.	Janet Waterhouse	14.20	
23.	Colin Leech	14.55	
24.	Tom Rose	15.58	
25.	Luisa Macmillan	16.00	
26.	Peter Nuttall	16.03	
27.	Kath Skinner	16.30	
28.	Gina Newton	18.22	
29.	John Anderson	25.00	left 3 mins after everyone else and perhaps didn't know the correct course because he came running back along the same way that he left.

LORNE ASL T-SHIRTS AND WINDCHEATERS

Still available Blue Wincheaters sizes 16 to 20 (1 of each), white T-Shirt sizes 12, 14 and 22 (1 of each) and 20 (4 left), Yellow T-Shirt, 1 size 22.

Send orders to: M. Hart

Prices are $7 for T-Shirt and $12 for Windcheaters, plus $2-3 postage. Invoices will be sent with garments. Do not send money with your order.

LIMNOLOGY BIBLIOGRAPHY

The following includes several installments of the bibliography on Australian Limnology. For the inclusion of references, please forward titles, abstracts, reprints or citations to Russell Tait, Esso Australia Ltd., G.P.O. Box 4047, Sydney, N.S.W., 2001. Please keep those cards and letters rolling in.

1984:

LLOYD, L.N. Exotic fish: Useful additions or "animal weeds". Fishes of Sahul 1:31-34,39-43.

TIMMS, B.V. Seasonal and depth distribution of the benthos of Lake Pearson, Canterbury. Mauri Ora 11:89-98.

TIMMS, B.V. The Cladocera (Crustacea) of New Caledonia. Proc. Linn. Soc. N.S.W. 108:47-57.

1985:

ANDREWS, A. A new species of Galaxias from southern Tasmania. Proc. R. Soc. Tas. 119:55.

CROOME, R.L., DURRSCHMIDT, M. & TYLER, P.A. A light and electron microscopical investigation of Mallomonas splendens (G.S. West) Playfair (Mallomonadaceae, Chrysophyceae). Nova Hedwigia 41:463-470.

CROOME, R.L. & TYLER, P.A. Synura australiensis (Mallomonadaceae, Chrysophyceae), a light and electron microscopical investigation. Nord. J. Bot. 5:399-401.

DURRSCHMIDT, M. & CROOME, R. Mallomonadaceae (Chrysophyceae) from Malaysia and Australia. Nord. J. Bot. 5:285-298.

KOEHN, J.D. The Gellibrand River: a valuable recreational fishery. Parkwatch 142:24-26.

KOEHN, J.D. & McKENZIE, J.A. Comparison of electrofisher efficiencies. Tech. Report Series No. 27. Arthur Rylah Institute for Environmental Research.

KOEHN, J.D, JACKSON, P.D., O'CONNOR, W.G., BEATTIE, S.L. & GIBB, R.C. An annotated bibliography of freshwater fish studies. Tech. Report Series No. 24. Arthur Rylah Institute for Environmental Research.

LLOYD, L.N. Keeping native freshwater fish in captivity. Proc. 5th. Ann. Aust. Soc. Zookeepers Conf., Adelaide, 1984.

MERRICK, J.R. & MIDGLEY, S.H. Note on the winter diet of Golden Perch (Macquaria ambigua) in Queensland. Proc. R. Soc. Qd 96:61-62.

PIERCE, B.E., LLOYD, L.N. & HORNE, P. The biology of Blue Lake, Mt. Gambier, S.A. S.A. Naturalist 59:63-66.

TIMMS, B.V. An investigation of sampling strategies for lake benthos. N.Z. J. Mar. Freshwater Res. 19:71-78.

1986:

ARTHINGTON, A.H., YEATES, G.W. & CONRICK, D.L. Nematodes, including a new record of Tobrilus diversipapillatus in Australia, as potential indicators of sewage effluent pollution. Aust. J. Mar. Freshwater Res. 37:159-166.

BALLA, S.A., LLOYD, L.N. & PIERCE, B.E. Unwanted aquarium fish. Search 16:300-301.

BENZIE, J.A.H. Phylogenetic relationships within the genus Daphnia (Cladocera : Daphniidae) in Australia, determined by electrophoretically detectable protein variation. Aust. J. Mar. Freshwater Res. 37:251-260.

BOWLING, L.C. & TYLER, P.A. The underwater light-field of lakes with marked physico-chemical and biotic diversity in the water column. J. Plankton Res. 8:69-77.

BOWMER, K.H. Rapid biological assay and limitations in macrophyte ecotoxicology: a review. Aust. J. Mar. Freshwater Res. 37:297-308.

BUNN, S.E., EDWARD, D.H. & LONERAGAN, N.R. Spatial and temporal variation in the macroinvertebrate fauna of streams of the northern jarrah forest, Western Australia: community structure. Freshwater Biology 16:67-91.

CAMPBELL, I.C. Life histories of some Australian siphlonurid and oligoneunid mayflies (Insecta; Ephemeroptera) Aust J. Mar Freshwat. Res. 37:261-288.

CHESSMAN, B.C. Dietary studies of aquatic insects from two Victorian rivers. Aust. J. Mar. Freshwater Res. 37:129-146.

CHESSMAN, B.C. Impact of the 1983 wildfires on river water quality in East Gippsland, Victoria. Aust. J. Mar. Freshwat. Res. 37:399-420.

CHUBB,C.F. & POTTER, I.C. Age, growth and condition of the Perth herring, Nematolosa vlaminghi (Munro) (Dorosomatinae), in the Swan Estuary, south-western Australia. Aust. J. Mar. Freshwater Res. 37:105-111.

CROOME, R.L. & TYLER, P.A. Mallomonas sabulosa (Chrysophyceae), a new species from Australia. Br. phycol. J. 21:93-96.

CROWLEY, L.E.L.M., IVANTSOFF, W. & ALLEN, G.R. Taxonomic position of two crimson-spotted rainbowfish, Melanotaenia duboulayi and Melanotaenia fluviatilis (Pisces : Melanotaeniidae), from eastern Australia, with special reference to their early life-history stages. Aust. J. Mar. Freshwat. Res. 37:385-398.

DAVIES, P.E. & SLOANE, R.D. Validation of aging and length back-calculation in rainbow trout, Salmo gairdneri Rich., from Dee Lagoon, Tasmania. Aust. J. Mar. Freshwater Res. 37:289-295.

DE DECKKER, P. & WILLIAMS, W.D. (Eds) Limnology in Australia. CSIRO/Dr. W. Junk, Melbourne.

FINLAYSON, M., CULLEN, P., MITCHELL, D., & CHICK, A. An assessment of a natural wetland receiving sewage effluent. Aust. J. Ecology 11:33-47.

GANF, G.G., STONE, S.J.L. & OLIVER, R.L. Use of protein to carbohydrate ratios to analyse for nutrient deficiency in phytoplankton. Aust. J. Mar. Freshwater Res. 37:183-197.

HARRIS, J.H. Reproduction of the Australian bass, Macquaria novemaculeata (Perciformes : Percichthyidae) in the Sydney Basin. Aust. J. Mar. Freshwater Res. 37:209-235.

HAWKINS, P.R. & GRIFFITHS, D.J. Light attenuation in a small tropical reservoir (Solomon Dam, North Queensland): seasonal changes and the effects of artificial aeration. Aust. J. Mar. Freshwater Res. 37:199-208.

HORWITZ, P.H.J. & RICHARDSON, A.M.M. An ecological classification of the burrows of Australian freshwater crayfish. Aust. J. Mar. Freshwater Res. 37:237-242.

KOEHN, J.D. Survey of fish fauna in Badger Creek and waters in the Coranderrk Bushland Reserve, Healesville Sanctuary. Victorian Nat. 103:36-43.

KOKKINN, M.J. Osmoregulation, salinity tolerance and the site of ion excretion in the halobiont chironomid, Tanytarsus barbitarsis Freeman. Aust. J. Mar. Freshwater Res. 37:243-250.

MARCHANT, R. Estimates of annual production for some aquatic insects for the La Trobe River, Victoria. Aust. J. Mar. Freshwater Res. 37:113-120.

NORRIS, R.H. Mine waste pollution of the Molonglo River, New South Wales and the Australian Capital Territory: effectiveness of remedial works at Captains Flat mining area. Aust. J. Mar. Freshwater Res. 37:147-157.

SALE, P.J.M & ORR, P.T. Gas exchange of Typha orientalis Presl. communities in artificial ponds. Aquat. Bot. 23:329-339.

SHIEL, R.J. & KOSTE, W. Records of rotifers epizoic on cladocerans from South Australia. Trans. R. Soc. S.A. 109:179-180.

TAIT, R.D. Rundle oil shale project: the environment. Proc. 3rd Australian Workshop on Oil Shale, Lucas Heights, 1986 p 253-258.

TIMMS, B.V. Reconnaissance limnology of some coastal dune lakes of Cape York Peninsula, Queensland. Aust. J. Mar. Freshwater Res. 37:167-176.

WILLIAMS, W.D. Conductivity and salinity of Australian salt lakes. Aust. J. Mar. Freshwater Res. 37:177-182.

YULE, C. Comparison of the dietary habits of six species of Dinotoperla (Plecoptera : Gripopterygidae) in Victoria. Aust. J. Mar. Freshwater Res. 37:121-127.

COMING EVENTS

1987

8-14 FEBRUARY
Twenty third SIL Congress, Hamilton, New Zealand, Contact: Convention Management Services, PO Box 3839, Auckland, New Zealand

16-20 FEBRUARY
ABRS Protozoology Workshop, Zoology Department, Adelaide University. Contact: Dr P. O'Donoghue, Protozoology Laboratory, Central Veterinary Laboratories, Dept of Agriculture, C/- IMVS, Frome Road, Adelaide 5000 SA. Telephone (08) 2287355.

16-20 FEBRUARY
Fourth International Symposium on the Interaction between Sediments and Water, Melbourne. Contact: ACTS GPO Box 1929 Canberra ACT 2601.

18-24 FEBRUARY
Fifth international conference on Ephemeroptera, Marysville, Victoria. Contact: Dr I. Campbell, Water Studies Centre, Chisholm Institute of Technology, East Caulfield, Victoria 3145.

18-24 FEBRUARY
Ninth international conference on Plecoptera, Marysville, Victoria. Contact: Dr I. Campbell, Water Studies Centre, Chisholm Institute of Technology, East Caulfield, Victoria 3145.

11-15 MAY
Third International Symposium - Toxicity Testing using Microbial Systems, Valencia, Spain. Contact: D. Liu or B.J. Dutka, Toxicity Symposium Committee Co-Chairman, NWRI PO Box 5050 Burlington, Ontario, Canada L7R4A6.

12-16 MAY
Australian Marine Science Association 1987 Conference and 1987 Australian Physical Oceanography Conference, James Cook University, Townsville. Contact: Dr J. Andrews, Secretary 1987 AMSA/APOC Conferences, Australian Institute of Marine Science, PMB No 3, Townsville MC QLD 4810.

22-25 MAY
Ecopolitics II, Centre for Environmental Studies, University of Tasmania. Contact: Tasmanian University Research Company Ltd, GPO Box 252C, Hobart, Tasmania 7001.

25-29 MAY
Biology in Water Management, Academic Committee of the Hungarian Academy of Sciences, Veszprem, Tolbuchin U 37 Hungary. Contact: Secretariate, Budapest VI., Rozsa F.u. 91. H-1064, Hungary.

15-20 JUNE
International Conference on Reservoir Limnology and Water Quality, Ceske Budejovice, Czechoslovakia. Contact: Dr M. Straskraba, Hydrobiological Laboratory, Inst Landscape Ecology, Czeckoslovak Academy of Science, Na Sadkach 7, 370 05 Ceske Budejovice, Czecholslovakia.

24 JULY - 1 AUGUST
XIVth International Botanical Congress, Berlin, FRG. Contact: XIVth International Botanical Congress, Botanisches Museum Berlin-Dahlem, Konigin - Luise - Strasse 6-8, D-1000 Berlin 33, FRG.

3-5 AUGUST
Seventh International Symposium of Astacology, Museum of Zoology, Palais de Rumine, Place de la Riponne 6, PO Box 448 CH-1000 Lausanne 17, Switzerland.*

20-30 AUGUST
XVI Pacific Science Congress, Seoul, Korea. Contact: Professor J.I.F. Urtado, Chairman/Convenor, Freshwater Sciences Committee, C/- Commonwealth Secretariat, Marlborough House, Pall Mall, London SWIY SHX England.

24-28 AUGUST
ANZAAS Congress "Science and Life in the Tropics", Townsville. Contact: ANZAAS Congress Secretariat, James Cook University, Townsville Qld 4811.

1988

FEBRUARY
International Symposium on Predation on Zooplankton by Organisms other than Fish,* Broa, Sao Paulo State, Brazil. Contact: J.G. Tundisi, Limnological Laboratory, CRHEA Department of Hydrology and Sanitation, USP Av Dr Carlos Botelho, 1465 Sao Carlos, SP 13560 Brazil.

29 AUGUST - 2 SEPTEMBER
First Biennial Water Quality Symposium, Banff Centre, Banff, Alberta, Canada. Contact: B.J. Dutka and D.L. Liu, Co-Chairmen Water Quality Symposia Committee, NWRI CCIW PO Box 5050 Burlington, Ontario, Canada L7R 4A6.

---

* Additional information available from editor.

Printed by CHISHOLM INSTITUTE OF TECHNOLOGY PRINTING SERVICES
900 Dandenong Road, Caulfield East, Vic. 3145